ISC Approved Team Processes

For ISO 9001 Compliance

Updated
August 12, 1999

Preface

The Information Systems Center (ISC) Approved Team Processes for ISO 9000 Compliance is under ISC configuration control. Approved changes to this document should be listed on this page as follows:

Section	Description
4/9/99	
2.0A	Rewrite to eliminate role of ISC Management in this process
1.1	New approved process- Managers Handbook for Software Development
4/20/99	
2.0B	Changes for clarification only
3.0A	Wording changes only
4.0A	Added information to be included in release letter
7.0A	Added information on Team and GSFC Level NCR reporting
8/12/99	
2.C	Added information on CCB
2.1	Added new process

Changes or questions concerning this document should be addressed to the ISC ISO representative.

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Section 1: Development Methodology

Team-1.0

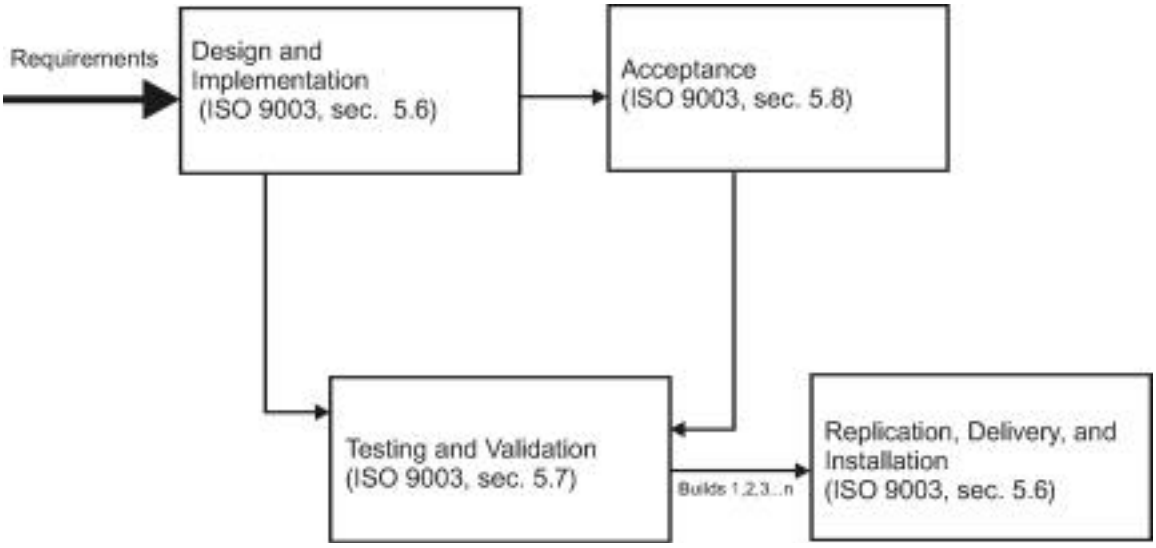

Figure D-1: Software Development Process

General:

- Requirements shall be documented and agreed upon between the customer and Team
- Changes to requirements and software shall be documented according to the ISC configuration management process
- Team should collect an agreed upon set of metrics in order to manage the development

Design and Implementation:

- Team shall develop the proposal for the method of satisfying customer requirements, determining use of Off-the-Shelf or new development, and considering customer's cost, schedule and quality . Proposal shall be reviewed with and approved by customer.
- Team should verify design by one or more of the following:
  - Reviews such as preliminary or critical design reviews, peer reviews
  - Design walkthroughs
  - Prototyping
- Team shall select a development methodology to control the quality of the software being developed. Examples of appropriate methodologies are Software Engineering Laboratory Recommended Approach, Software Engineering Laboratory Package-Based Development, SEAS Software Development Methodology, Flight Software….. A recommended methodology calls for design, development, testing and delivery of a small portion of the system on an iterative basis until the system is complete. This allows customer involvement in the development cycle and obtains early feedback on the system.

- Methodology should address the following:
- Programming rules
- Programming language
- Naming conventions
- Standards for commentary (program design language (Team Lead), comments).
- Code reading

Testing and Validation

- Software deliveries shall be tested against customer requirements and results shall be documented

Replication, delivery, and installation

- Delivery schedules and contents of software deliveries shall be agreed upon with the customer and the Team. Test status of the delivery should be discussed with the customer prior to delivery

Team-1.1

"Manager' Handbook for Software Development", SEL-84-101, Rev. 1, Nov. 1990, http://sel.gsfc.nasa.gov/doc-st/docs/84-101.pdf

Section 2: Control of Documents and Data & Quality Records

Team-2.0C

(Items include Quality Records, Documentation, and Data)

- The CCB consists of all parties on the signature page of the item under configuration control as determined by the Team Lead (TL).
- Quality record, documents, and data which are held and controlled at the Team level are managed by the Team Lead
- All items under Team configuration control are assigned an owner by the Team Lead.
- The Team Lead determines who is on the signature page for all items under configuration control
- The owner is responsible for maintaining the history and current version of the item
- A list of all configuration controlled items, identification number (if applicable), their owners, their latest version and their locations is maintained by the Team Lead
- The owner is responsible for ensuring that all information under his control is legible, readily retrievable and safe from damage/loss
- Recommendation for deletion of items from the Team level of control can be made by anyone through the owner, to the Team Lead. The Team Lead will then make the decision and proceed accordingly
- For items under configuration control requiring updates, the following change control process will be used:
- Changes to any item may be submitted by anyone to the owner of the configured item. This shall include an assessment of the cost and schedule impact, and changes required to other configuration controlled items
- The owner shall assign a change number and log the change request
- The owner will communicate with other owners affected by the item and any other personnel deemed appropriate in order to negotiate the acceptability of the change
- The owner will document the negotiated changes required by the various owners and distribute that to the owners and Team Lead
- Individual owners affected by this change are responsible for updating their respective configuration controlled items to reflect negotiated changes
- Notification of items that have been updated are to be sent to the Team Lead and to all affected personnel by each owner

Team-2.1

Configuration Control Board (CCB*)*

The CCB consists of all parties on the signature page of the item under configuration control as determined by the Team Lead (TL).

Controlled Items

The Product Development Plan details which design and test documents are controlled. The TL will determine if additional documents are to be controlled to remain compliant with GPG 8700.2b or other procedures or guidelines.

Placing Documents Under Control

- The document creator submits the document to the TL.
- The TL Reviews the document.
    - If rejected, the TL returns the document to the submitter with comments.
- The TL ensures that each document has a date stamp on its first page which, together with the document name, will serve as its document control designation. When necessary to differentiate recent updates, a time stamp may also be added.
- The TL will notify the customer of any updated or new documents that may impact the customer.
    - If required, the TL will submit the document for customer approval.
- The TL transfers accepted documents in electronic form to the designated computer and the directories reserved for current versions of documents.
- The TL will remove replaced documents from the active document directories.

Removing Documents Under Control

- The TL will review existing documents to determine if they will be replaced:
    - When a newer version of that document is accepted
    - When the lifetime of that document has expired, as defined in the *Quality Records List*.
- The TL will determine if superseded or obsolete documents should be saved
    - If the documents should be saved, these documents will be stored in archive directories with the designation “Obsolete” added to the first page
- The TL will remove superseded or obsolete documents from the directories reserved for current versions of documents.

Protecting Documents Under Control

- The TL shall set all electronically stored documents accessible via the network to read-only security level.
- The TL shall a create a backup copy of all documents stored electronically, to be stored on removable media (e.g., Jaz disk).
- The TL shall create all backup copies at the time a document is entered into the system, and upon any updates thereafter.

Section 3: Control of Customer Supplied Elements

Team-3.0A

- The Team Lead assigns an owner to this product
- For software, the owner places the software in the automated commercial Configuration Management development system
- The product is labeled with the Customers release identification
- Corresponding documentation or associated data bases should be labeled with the same identification number
- Copies of all information are made and the originals placed with the Team's Configuration Controlled data and documentation
- Where appropriate, the customer should install the product, provide a demonstration, and provide training (as required).

Section 4: Identification and Traceability of Products

Team-4.0A

- The identification number of the software will be assigned by the software commercial Configuration Management system being used
- All documentation should reference the appropriate software identification number
- All delivered releases should be retained as long as quality records are retained
- The release delivery letter should indicate the release identification number

Section 5: Product Inspection and Test Approach

Team-5.0

· The test plan(s) associated with a specific software release shall be documented after the design phase for that release and be labeled with the associated software identification number

Section 6: Control of Test Equipment and Software

Team-6.0

- If the testing software exists, does not require configuration, and is under Configuration Management, the software may be used without certification.
- If the testing software exists but must be configured, or if it must be developed, it should follow the normal software development cycle.
- Once assembled, this testing software must be checked against existing non configurable testing software, or the testing software and software being tested must be exercised and tested in a cyclic manner until confidence is built with both, or at least until the testing software is certified.

Section 7: Control of Non-Conforming Products

(includes identification, control, correction, disposition)

Team-7.0A

- The customer or any member of the Team may fill out a Nonconformance Report(NCR) during any phase of the project and turn it into the owner of the item (if known) or to the Team Lead (if unknown)
- The Team Lead will forward any Nonconformance Reports received to the appropriate owner
- The owner of the item will log in the Nonconformance Report
- The owner of the item will select an appropriate group (including the person who submitted the NCR) to analyze the problem, determine corrective action, and notify all affected owners of other items
- All affected owners shall then submit the necessary information to the appropriate Configuration Management process
- The owner of the item will maintain the status of the NCR in the Team NCR data base.
- After delivery of a release to the customer (or representative), the owner will determine if an NCR received meets the criteria set forth in GPG 1710.1 (section 2.1), and if so, will also enter the item in the GSFC NCR system.
- The Team Lead will discuss with the customer if the software release will be returned to the Team for correction or can be used as is until the next release is available.

Section 8: Corrective and Preventive Action

Team-8.0

- During the Product Nonconformance Process, the group selected to determine the appropriate fix for the problem shall determine the cause of the problem (including any process related causes), document any recommended changes, and submit them to the Configuration Management process for appropriate action

Section 9: Process for Product Maintenance

Team-9.0

- If no prior arrangements were made for servicing (corrections/enhancements), the customer should submit a request to the Business Selection Committee similar to the initial request.
- If servicing is part of the initial agreement, a Point of Contact for post-final delivery shall be assigned by the ISC Management Team. All original quality records shall be maintained throughout the servicing period plus one year.
- The customer and POINT OF CONTACT shall follow all appropriate processes defined in the original Product Plan associated with control of Nonconforming Products (including enhancements)

Section 10: Process for Process and Product Metrics Analysis

Team-10.0

- After the delivery of each partial release (and close-out), the Team Lead and customer shall meet to discuss and agree upon the value of the metrics associated with the release.
- The Team Lead and customer (and any additional personnel they deem necessary) meet to determine and document the causes contributing to the values assigned. The results are to be kept as quality records.
- The Team Lead and Customer shall determine if any corrective action should be made to any process or to the Product Plan for subsequent releases
- If changes are required, the Team Lead shall follow the appropriate process